

AMERICAN RAILROAD JOURNAL, AND GENERAL ADVERTISER



FOR RAILROADS, CANALS, STEAMBOATS, MACHINERY AND MINES. ESTABLISHED 1831.



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Correspondents will oblige us by sending in their communications by Tuesday morning at latest.

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AMERICAN RAILROAD JOURNAL. PUBLISHED AT 105 CHESTNUT ST. PHILADELPHIA. Saturday, November 27, 1847.

A WORD TO THE FEW.

The current volume of the Journal is nearly completed—four numbers more, and the Index, will complete the twentieth volume, and the fifteenth year of its publication. There are yet quite a number of accounts for the current year—as well as a few for previous years—which are not paid. This delay to each subscriber cannot benefit the parties while to us the delay of one or two hundred is a very serious matter, and may even be the cause of discontinuing the publication entirely.

The difficulty, and expense, of sending an agent to each subscriber—scattered, as they are, all over the Union—is to great to be encountered; and the losses from removal, changes of circumstances and death—when the accounts are suffered to run for several years—are to great for so small a circulation: therefore it has become a matter of necessity to call upon those in arrears to remit the amount by mail at once—before the close of this volume, if possible; and I will add that it will save trouble and postage, and be only a fair return for past delays, to enclose, at the same time, the next year's subscription. By doing so, they will materially promote our convenience, and the prosperity of the Journal.

I shall hereafter, while the Journal is under my charge, give to it my undivided attention, and hope to be able to make it deserving of a prompt and liberal support, and I shall look to every friend of the cause for aid in sustaining it.

D. K. MINOR, Editor.

Correction.—In the Report of Mr. Morjon, on the Gauge question—page 742, line 13 from top of first column—for "85" read 35 pounds less.

DEAN, PACKARD & MILLS, MANUFACTURERS OF ALL KINDS OF RAILROAD CARS, SUCH AS PASSENGER, FREIGHT AND CRANK CARS. ALSO SNOW PLOUGHS AND ENGINE TENDERS OF VARIOUS KINDS. CAR WHEELS AND AXLES fitted and furnished at short notice; also, STEEL SPRINGS of various kinds; and SHAFTING FOR FACTORIES. The above may be had at order at our Car Factory, REBEL DEAN, ELIJAH PACKARD, ISAAC MILLS, SPRINGFIELD, MASS.

Louisville and Frankfort, Ky., Railroad. The surveys upon this line have, we are informed, been prosecuted with spirit and success for some months past, with good success. A very favorable route has been found, over which a railroad can be constructed, with grades and curves highly favorable, and at a cost much within the average of our eastern roads for graduation. A report is now in preparation, to be submitted to the stockholders on the 9th of December, when will be decided the question of action, which we trust will be both prompt and energetic; as the period has arrived when Kentucky owes it to herself to construct railroads which will open an easy communication from her sea-board—the Ohio—to the interior. The truth is, the people of Kentucky cannot afford to be without better means of transportation and travel.

New Inventions—of Old Instruments. The following has been sent us by way of showing that what has been long in use, and of much utility in this country, has been recently discovered in England. Similar discoveries are often made—not only in England, but in this country also. "BLADE PROTRACTOR. (With an engraving, Plate XVI.) Registered by Mr. James Basire, Jun., of Red Lion Square." Civil Engineer and Architect's Journal, page 310, London.

The above appears to have been entered for patent on 4th August, 1847, as an original invention of Mr. Basire of London, but most of the civil engineers of the United States are familiar with it. The writer of this recognizes it as an acquaintance of long standing, he certainly saw one in 1836, since which he has seen it as an instrument of every day life, in every Engineer's office that he has

visited in the state of New York. Mr. Squire Whipple, of Utica, N. Y., invented it about 1833 or 34, and has since that time improved upon it, though I believe it never has been patented in this country. Probably the improvement will be patented, in a few years, in England, and cut off Mr. Basire's, unless he happen to be the fortunate man to discover it. Yours, Shady Side, November 18th, 1847.

Schuylkill Coal Trade. PHILADELPHIA AND READING RAILROAD.—Amount of coal transported during the week ending Thursday, November 18, 1847.

| | |
|---------------------------|--------------|
| From Port Carbon..... | 11,004 00 |
| " Pottsville..... | 5,126 02 |
| " Schuylkill Haven..... | 12,483 05 |
| " Port Clinton..... | 3,202 11 |
| Total for week..... | 31,815 01 |
| Previously this year..... | 1,201,566 16 |

Total.....1,232,466 17. Supt. Coal Tr. P. & R. R. Co. SCHUYLKILL NAVIGATION.—Week ending November 21, 1847.

| | |
|---------------------------------|------------|
| Pottsville and Port Carbon..... | 7,275 00 |
| Schuylkill Haven..... | 2,471 01 |
| Port Clinton..... | 00 00 |
| This week..... | 9,746 01 |
| Previously..... | 211,895 06 |
| Total..... | 221,641 07 |

Tide Water, Pa., Canal Trade. "On Tuesday last," says the Philadelphia Commercial List of Nov. 20, "the steamer Kingston towed to this city thirty-four large canal boats, which descended the Tide Water canal to Harre de Grace, laden with full cargoes. This was the largest 'tow' ever brought from Delaware city."

The following articles composed the largest portion of their freight—Iron being the most prominent.

| | |
|----------------------|-----------|
| Pig Iron, lbs..... | 1,102,000 |
| Railroad Iron..... | 229,242 |
| Castings..... | 99,262 |
| Lumber, feet..... | 267,458 |
| Shingles..... | 360,400 |
| Staves, bhd. No..... | 2,360 |
| Bricks..... | 100 |

There was not a single barrel of flour or a bushel of wheat in any of these boats. The crop of wheat in the interior of the state is very light and considerable.

table supplies are transported from this city to various points in the interior for grinding.

This is a very different state of things from last year. The business on the Chesapeake and Delaware canal is steadily increasing. During the week ending November 10, at noon, there passed through this canal 970 tons of goods—also 723 cords of wood.

Ten Wheeled Locomotive Engines.

In the early days of railways in England, a rail that weighed 35 lbs. to the yard was a heavy rail—and a locomotive that weighed over five tons, with water in its boiler, was excluded from the society of its fellows on the Liverpool and Manchester road, and not allowed the honor of hauling his majesty, William the IV. at the trial of engines in October, 1825—but things have wonderfully changed during the past eighteen years—what was then a heavy rail has been entirely discarded for locomotives, and locomotives that were then pushed out of good society because they were too heavy, are now discarded because they are too light. Rails of 50 to 60 lbs. to the yard are now preferred, and locomotives must weigh from 12 to 25 tons in order to come up at all to the spirit of the age. Formerly we should as soon have looked for 6, or 8 legs upon a horse, as for that number of wheels upon a locomotive, but such has been their rapid growth, and such is their enormous weight, that they now have six, eight, and even ten wheels.

It is amusing, as well as instructive, to look back, occasionally, and compare the past and the present. And we will compare a performance upon a neighboring railroad, in July, 1832, with the regular working upon the Reading road in 1847.

We give the following, from the Railroad Journal of July 14, 1832. It is headed "Railroad Experiments," and reads thus:

"*Railroad Experiments.*—Extract from the report of John Randel, Esq., Engineer in chief of the New castle and Frenchtown railroad company, to the Board of Directors, dated Newcastle, July 4th, 1832, relative to the performance of the locomotive 'Delaware.' This engine is one of Stephenson's make, with Booth's patent boiler, and this is the first effort made with her."

"Yesterday and to-day, says Mr. Randel, I made a trial of this engine between this place and Frenchtown, and have the satisfaction of being able to say it works well. The large radii of our curves—the least being 10,000 feet—will enable us to pass through them without abating its velocity."

"In going yesterday to Frenchtown, we passed through the 5th curve—radius 20,000 feet—with a velocity of 15 miles per hour, and in returning we passed through it at a velocity of 20 miles an hour."

"Although every part of our road is in good repair, yet, to insure safety, the embankments were crossed at a reduced velocity; shutting off the steam before we arrived at them, notwithstanding which we averaged, for the whole distance in going to Frenchtown, about twelve miles an hour; and when returning to Newcastle—twelve miles of the distance being performed after dark—we averaged upwards of ten miles an hour."

"Such was the performance of one of the first—if not the first—locomotives used in this country—only seven years ago, and it was then deemed astonishing; as Mr. Randel says 'the shortest period of time within which we passed from one mile post to another was two minutes—or at the rate of thirty miles an hour.' It was a performance to be talked about—and it was much spoken of—but the locomotives of the present day do better than that, as will

be seen by the following statement in relation to the locomotives on the Reading railroad. The 'Chesapeake' spoken of is one of Norman's improved ten wheeled engines, of which the accompanying cut is an illustration. It has six driving wheels and weighs 19½ tons, with 14½ tons on the drivers.

Mr. Nicolls speaks of it as follows, in a letter dated May 27th, 1847, in relation to inquiries made as to its performance.

He says—"The 'Chesapeake' has been running for about two months, upon the Reading railroad, doing duty regularly with its other engines, in its coal trade."

"Her performance has been entirely satisfactory. She hauls more coal cars, in proportion to her adhesion, than any other engine on the road. She passes through curves of any radius, with as much ease as any other engine we have. She is less injurious, in proportion to her gross weight, or to her adhesion, upon the rail, curves and bridges, than any engine hauling coal upon the Reading railroad: from which it follows, that the amount of coal hauled by the 'Chesapeake' for any given period, is passed over the road with less wear and tear, and risk of accidents to rail and bridges, than by any other engine used upon same road."

"Their comparative weights and trains are as follows, viz:

"The 8 wheel engines in common use weigh 22½ tons, have 22½ tons adhesion, and haul 413 tons of coal.

"The 6 wheel engines weigh 19½ tons, have 19½ tons adhesion, and haul 398 tons of coal."

"The 'Chesapeake,' 10-wheel engine, weighs 19½ tons, has 14½ tons adhesion on her six drivers, and hauls, with as much ease as the other engines, her allotted load of 394 tons of coal."

"I consider that the Chesapeake possesses to a greater extent than any other engine, I have yet seen, the combined qualities of efficiency and ease to the rail and bridges."

I am very respectfully yours,

(Signed) G. A. NICOLLS,
Engineer, etc., Reading Railroad.

After five months further use, having passed over the road more than 130 times, Mr. Nicolls writes as follows, dated "Reading, Pa., October 29, 1847."

"Messrs. NORMAN, BROTHERS, PHILADELPHIA."

"Gentlemen:—I have just received your favor of 28th instant, in relation to your Chesapeake engine."

"I have the pleasure of stating that the 'Chesapeake,' 10 wheel engine, built by you for this road, has run since March last, some 13,000 miles, in the coal trade of the road."

"She turns curves with as much ease as any other engine we have, and has proved as safe in keeping the track."

"In her performances in detail, as compared with those of other engines, I beg to refer you to my letter of 27th May last, on same subject."

Very respectfully yours,

(Signed) G. A. NICOLLS.



Iron Bridges.

We referred, in the Journal of 13th inst., to Mr. Whipple's treatise on bridge building. We have the opinion of eminent engineers in favor of Mr. Whipple's plans and views, from which, and the examination of a small model exhibited to us at our office, and we believe also at the Fair of the Franklin Institute, we are led to form a high opinion of his iron bridges, especially for railroads—and therefore we give place to the following communication.

For the American Railroad Journal.

I wish to make a few remarks upon "Rider's Iron Railroad Bridge" upon the Harlem railroad, a little north of the tunnel, for the purpose of making practical deductions relative to the economy and safety of iron bridges for railroads generally.

This bridge is 70 feet long and about 20 feet wide, has two pair of ways, and is supported by two iron trusses, about 7½ feet high from centre to centre of the upper and lower horizontal ribs or stringers. These stringers are parallel, the upper one of cast

iron, of a T formed cross section, containing about 12 square inches to each truss. It is cast in two symmetrical parts, put together so as to "break joints." The lower stringer is composed of two series of bars or plates of wrought iron, each 4 inches deep by ½ inch thick, placed ½ of an inch apart, to receive ½ inch diagonal bars between them. These stringer bars are spliced so as to "break joints," and at each splicing is a plate 4½ inch, about 20 inches long, with two bolts each side of the joint.

There are vertical struts of cast iron, about 3 feet 4 inches apart, of an H formed section, containing about 8 square inches, extending from the upper to the lower stringer. Two diagonal ties of wrought iron, 2½ in the center, and 2½ in at the ends of the truss, crossing one another and passing through a hole in the centre of each vertical strut, being secured to the top and bottom stringers by a bolt through each end. The above are the essential parts of the truss.

I estimate the weight of this structure approxi-

imately at 32,000 lbs., equal to its effects towards breaking the truss in the centre to 8,000 lbs. on the centre of each truss.

I also estimate the ordinary freight trains passing over the bridge, at 1000 lbs. per foot; (only half what I am in the habit of estimating the possible load of a railroad bridge). Of this weight, about 1 is sustained by one truss, the centre of the track being about 5 or 6 feet from one truss, and some 15 feet from the other. The load of 70,000 lbs. then, is equivalent to $1 \times 70,000 = 26,250$ lbs. in the centre of the truss, which added to the 8,000 for the weight of structure, gives 34,250 lbs.; and one-half of this weight, is the force with which each abutment would react upon the truss, with such a load in the centre.

Now, regarding the centre of the top stringer as a fulcrum, half the length of truss as the average, 17,025 lbs. $(= 1 \times 34,250)$ as the force; the cohesion of the lower stringer as the resistance, and 7 1/2 feet, (the height of truss from centre to centre of stringers) as the leverage upon which the resistance acts. The following equation gives the tension T of the lower stringer, in sustaining the load, $75 (= 17,025 \times 35)$. Whence $T = 80,000$ lbs.; very nearly, $= 20,000$ lbs. to the square inch of cross section, allowing nothing for the portion of the bars cut off by the bolt holes for connecting the diagonals, which cannot be much less than 1/4 of the whole. This would increase the tension to 26,666 lbs. to the square inch.

It may be thought that a portion of this truss is sustained by the diagonals. It is clear enough, that in the absence of the lower stringers, the diagonals would receive the strain which otherwise falls on the lower stringer. But as the truss is constructed, when loaded uniformly throughout its whole length, those diagonals only are brought into action which extend upward and outward, in the direction from the centre towards the ends of the truss; and at the centre of the truss, the diagonals running upward and outward as above stated, are connected with the lower stringer some 4 or 5 inches asunder, and consequently cannot relieve the stringer of any part of the horizontal strain.

It may be possible, however, to strain up the diagonals so tight as to produce some relief to the stringer, but such condition of things is not to be depended on. It is manifest that the lower stringer should be adequate to sustain all the horizontal stress occasioned by the uniform load.

It appears then, that a portion of the wrought iron in the bridge in question, is liable to a stress of more than 26,000 lbs. to the square inch, from a dead load on one track, of 1000 lbs. to the foot run, and yet the bridge endures the daily and rapid transit of the trains of the Harlem railroad.

If, then, bridges be built on the plans I have given in my work on bridges, which are estimated to sustain trains of twice the above weight, or 2000 lbs. to the foot run, with a stress of only 10,000 lbs. to the square inch of wrought iron, on any part, instead of 26,000 lbs. as above, or less than 1/4 of the stress for the same load, will not the chances of failure be reduced almost beyond the range of possibility, as far as wrought iron is concerned?

I have not time now to pursue this subject, nor is it necessary to my purpose. I only wished to point to the experimental lesson afforded by the bridge here spoken of.

If I have committed any errors in calculation or otherwise, I shall be very thankful to any one who will point them out. I am certainly far from expecting to promote my own interest by continuing in

error myself, or by leading others into error on this subject.

Utica, N. Y., Nov. 1, 1847.

For the American Railroad Journal.

Railway Breaks.
In looking over several of your back numbers, I find that you are trying to impress upon inventors the importance of bringing out some kind of improvement in breaks for railroad cars, so much needed to secure safety to lives and property in railroad travelling. You refer, I believe, to a break, to be under the control of the engineer, and by him applied to a whole train of cars. I have no doubt this might be done, still it must, I think, be attended with such difficulties as will always prevent its adoption; especially as there is no difficulty in making breaks, on the common plan, with sufficient power to hold, and cause all the wheels of a train to slip on the rail. It is only necessary that railroad companies furnish a good breakman, to each car, instead of one or two for six or eight cars, as is usually done—and, indeed, of what use are breaks on each car, if they are not applied when needed. Railroad companies generally dislike to use breaks that will entirely stop the wheels and cause them to slide, and they may well do so, as wheels are thus much injured by having flat places on the tread, giving them a more violent concussion to both wheels and rail, and producing a very unpleasant motion to cars and passengers.

Now, sir, if there is any way to compel railroad companies to increase the number of breakmen, especially on passenger trains, all possible safety can be secured by the use of the old break. There is not so much need of a breakman on every car for freight trains, as their speed is much slower. But if any one should be fortunate enough to introduce a break that will be free from objections, it certainly would be a valuable work for the discoverer, and well might he claim the gratitude of the travelling public, while he would see its adoption by all railroad companies.

Yours respectfully,
F. M. RAY.
New York, November 11, 1847.

REMARKS.—The great object, as we conceive, of improved machinery, is to accomplish the desired object in a better manner, at less expense, than in the ordinary way; and therefore it is, that we have so frequently called the attention of our readers, among whom we are sure there are many able inventors—to the subject of an improved break, by which a train may be brought to a stand still, if need be, in the shortest possible time, without making any of the wheels slide on the rail—and thus injure, not only the wheel, but also the cars and road, and also without the increased expense to the company, or to the business of the road, of a breakman to each car.

It may be a difficult thing to do,—but it can and must be done—to arrange a break on each car, which shall touch every wheel, and yet be under the control of one man—or two men—not the engineer especially, though it may, perhaps, be so arranged that he may put it in operation, in case the brake-man should be out of his post at the critical moment.

The reason why it is necessary to break a car so hard as to make the wheels slide, is that so few wheels are touched by the break. A train of six passenger cars has 48 wheels, and if each wheel is borne upon at the same time, to the extent of half or two-thirds the power required to make them slide, and the engine properly managed same time,

the train will very soon stand still,—though sixteen of those wheels might slide on the rail, and yet not stop the train in so short a distance.

The great object we have in view is to avert danger, and avoid increased expense and we are quite sure it is only necessary that the attention of the right man should be turned to the subject to accomplish the object; and we doubt not he, who ever he may be—will derive more benefit from it, when it shall be accomplished, than did the inventor of the entire railroad system. Small things often yield more profit to the inventor than mighty ones.

South Carolina Railroad Report.

This report for 1846, with one or two others, received some months since, has been laid aside until it is almost time to look for another for 1847—it is not, however, too late to bring it into the volume where it belongs, and we therefore now give it a place to keep up the history of this work, which was one of the first railroads brought into use in this country, and for some years the longest line of railroad in the world under the management of one company.

On referring to the volumes of the Journal, we find the first report published by us, in relation to this road, by that accomplished engineer, Horatio Allen, now of New York, was published on the 17th of March, 1832—and the second on the 2d of June, of the same year—of course it is due to it, and to ourselves, to continue its history from year to year, as long as we have the supervision of the Railroad Journal.

It will be seen, on referring to the report, that the earnings of the road were, in 1846, \$30,383 greater than in 1845. The increase of 1847 over the previous year will probably be more than twice that amount.

We are gratified to learn that the wise policy of liberality and co-operation exists between the different lines of railroad in that region—that they repudiate all idea of monopoly, of rivalry and competition, and look upon each as a part of a common system; the veins and arteries of a great commercial body, animating in the reciprocal circulation of its trade, the whole, and paralyzing by impediments, or restrictions, no portion.

This is as it should be, and we hope to see this wise policy pursued throughout the country.

It will be seen that the Camden branch is in a fair way for completion; and efforts are now making to extend the Columbia branch to Greenville and the Camden branch to Charlotte, in North Carolina, and thus open a wider field to Charleston. It is possibly, fortunate that the publication of this report has been delayed until this time, as it will be better understood, and all its connections seen upon the map published by us in this number, to show the importance of an early construction of the line from Wilmington to Manchester, and thus fill up that unseemly gap.

CHARLESTON, S. C., 2nd Feb. 1847.

To the Stockholders of the South Carolina Railroad Company.

GENTLEMEN: The board of directors have the honor of presenting to the stockholders their third annual report of the operations of the South Carolina railroad company, for the year ending the 31st of December, 1846.

The gross receipts for freight, passengers and mail service, for the year 1846, was \$558,697 71.

The expenditures for same period, embracing ordinary current ex-

penses: additional machinery, improvements on depots, and interest on foreign and domestic debt, was \$389,148 10

Amount of dividends paid \$147,900 00

Balance applied to improvement of property, \$21,649 61

From the above, two semi annual dividends of \$2 25 and \$2, making \$4 25, on each share, was declared, being within a fraction of 5 1/2 per cent. on the par value, \$75 of the road stock, and leaving as shown, \$21,649 61 applicable to objects as stated.

The gross receipts from all sources for the year 1846, were \$589,081 52

The expenditures for same period, including current expenses, additional machinery, improvements on depots, interest account, paying Meeting street, and damages, were \$418,171 17

Amount of dividends paid \$140,725 50

Balance applied to improvement of property and reduction of indebtedness, \$30,181 85

The two semi annual dividends were, for the first half year \$1 50, and the last \$2 50, making \$4 on each share, and equivalent to 5 1/2 per cent. on par value of stock, and leaving an exhibited \$30,181 85, applicable to improvements. The large amount under the general head of expenditures for the year '46 as compared with those of the previous years of 1844 and 1845, may be explained by an appropriation for the improvement of Meeting street, and for damages; particularly in the loss from fire, (supposed to be the act of an incendiar) of a large amount of cotton, while in the cars on the track at Aiken, ready for departure by the downward train the next morning. If these amounts, as in the auditor's comparative statement of ordinary expenses, since the consolidation of the two companies be deducted, we have for the legitimate and unavoidable expenditures, under all the various heads, of current, materials, property, and interest account, \$282,972 31 in the year 1844—279,475 43 for 1845 and 300,672 25 for 1846—showing, as compared with 1844, an excess of expenditure of 17,099 91, against an increased receipt of \$56,210 57; and as compared with the last or previous year, an excess of 21,196 79 of expenditure against 30,383 91 of increased receipts. A considerable portion of this excess of expenditures may be accounted for in the enhanced cost of supplies; in the large amount of materials on hand (as exhibited in the schedule from the master of the work shops;) in preparation for the construction of an additional number of cars; and in the increased expense necessary to preserve the track of the Hamburg road from the injuries inflicted by the heavy locomotives, and the higher speed of the passenger trains. The relative proportion likewise between the receipts and expen-

ditures this year, were greatly disturbed by the low rate (with a view of relieving the suffering planters of the interior) at which the company undertook to transport grains.

Upwards of 250,000 bushels of corn alone the last season, were transported to Columbia, Hamburg and intermediate stations; and at the moderate rate of freight charged, a portion of it free, it is apparent that much the largest moiety of the amount was made chargeable in the columns of expenses, while a very small balance was carried to the credit side of receipts. The receipts of the first half year of 1846, which were greatly affected by the reduced crop of 1845, had likewise an influence in disturbing the relative proportions between receipts and expenditures, for by reference to the auditor's accounts it will be seen that of the amount \$589,081 52, received for the year 1846; but 251,741 36 were taken in the first half year, while the last half year, the receipts were swollen to 337,340 16; and under such a pressure on our locomotives, cars and available force, as unavoidably to involve greater expense from the necessity of loading cars and running the trains at night.

The report of the auditor with the accompanying tabular statements, numbered from 1 to 7, exhibits in a clear view, the state and condition of the property and finances of the company, with its liabilities, assets, etc., for the year 1846; and of the monies received and expended on account of the stock, and on the construction of the Camden branch road. The tabular statements Nos. 4, 5 and 7, exhibit the number of passengers conveyed on the road, the amount of freight, separating that which goes into, from that which comes from the interior, the number of bales of cotton received at each station, the number of packages and pieces of merchandize forwarded by railroad into the interior, and the amt of articles received by railroad for transmission to other places, with a comparative statement in table No. 7, of the income of the road for the last three years (commencing with the consolidation) from all sources, exhibiting the average number of locomotives in active service, their arrivals and departures, with the number of miles run. Appended to these documents is a statement, for the last three months of the year, commencing with the more recent extension of the lines of railroads to the west; from our agent in Hamburg, of the number of packages of merchandize, with the value of the freight thereon, forwarded to the different stations beyond Atlanta in Georgia, where the trade with North Alabama, the Coosa district and eastern Tennessee may be said to commence, with an exhibit of the returns of the same in cotton, grains, western productions and domestics. From these beginnings of a trade, just emerging from the western horizon, the extent of which, in the future cannot be estimated, and must greatly exceed even the speculations of the most sanguine—the stockholders will be the better judge of the facilities, which it is for the interest of this company to continue to afford. In connecting the forwarding, with the other obligations of

common carriers, your direction have been influenced not merely by the example and practice of other companies competing for the same business, but with a view of so cheapening and of so perfecting the means of transportation as to bring not only contiguous points, but even those the most remote, in certain and intimate communication with each other, thus augmenting the transportation on the road as the ranges and circles of commercial intercourse were extended, diverting to, and through Charleston, merchandize and produce which hitherto sought the markets of consumption by other channels; and into which they would still continue to flow, if equal and greater facilities were not afforded by what is now known and designated as the Carolina and Georgia route to the west. The policy pursued has not been without its favorable results on the transactions of the road. As this matter, however, was referred to a committee to report on, your board do not consider any further remarks necessary beyond the presenting, on this occasion, statements and facts for the determination of the maturer judgment of the stockholders.

The report of the superintendent of the road, Mr. Lithgoe, is not as favorable as your direction could have desired. His statements which have been confirmed by the inspections of the president, are: that the track, from the very light iron rail in use on the Hamburg portion of the road, is beginning to suffer from the heavy freight trains, and locomotives, which the increased business has now rendered indispensable. The greater number of passengers in the daily trains, and the higher speed exacted under contract for mail service, and to meet the competition of other travelled routes, have likewise conspired to produce similar injurious effects. The iron rail is wearing daily, and in some instances has become so thin, (though of the flange form) as to be very little superior to the common flat bar, which the South Carolina canal and railroad company found necessary, at a former period, to remove. This subject, in part, was brought to the notice of the stockholders in the last annual report, and the recommendation of importing a certain amount of new rails annually to be substituted for those which were impaired, met with your concurrence; subsequent experience, however, afforded more time for examination; and which accords with that of other railroad companies in Europe and the United States; who, in the first instance, used rails of a moderate weight on their tracks, with the views of Mr. Lithgoe, (under whose daily inspection is brought the effects of heavy weights in rapid motion on a light superstructure,) would favor the policy of preparing at an early date for the gradual substitution of 5 or 10 miles annually of a heavier; for the flange rail now in use, to the extent at least of the main trunk of road from Branchville. This trunk, 62 miles in extent, now sustains the business of both the branches to Columbia and Hamburg, and will soon have added that of the Camden and other roads now projected, with the view of a connection with the South Carolina. Promptness of execu-

tion, certainty and security are the strong recommendations of railways, and if they are not so constructed as to ensure these requirements by the public, the transportation on them will diminish or be executed without satisfaction, with frequent interruptions and at great hazard. The stockholders of the Baltimore and Ohio company, the road of which was constructed, on the lower section from Harper's Ferry, with a light flat bar, have commenced the substitution of an iron rail of a heavier and more serviceable weight, and the able report of its engineer, accompanied with valuable statements and calculations of the injury inflicted on iron rails, according to the velocity and amount of tonnage transported, periodically over them, demonstrates that in the greater annual expense of maintaining a track with a light rail, the company in the course of time will be amply remunerated for the larger capital, which in the first instance a rail of heavier weight will involve. The experience on that road (which in all its operations is more assimilated to those of South Carolina, than any more to the north of it) but made more apparent from the heavier amount of tonnage transported than the South Carolina has as yet attained; has been amply confirmed by the report of Mr. Lithgoe. While the maintenance of way on the Columbia road, constructed on cross ties, with a T rail of 57 lbs. to the yard, (though the timber of a considerable portion of the lower section had to be removed,) does not exceed \$160 to the mile—that on the Hamburg road has amounted to \$351—and even at this cost the superstructure in many places, has with great difficulty been preserved in the condition that the interests of the the company prescribes. The present iron, (says the superintendent,) embeds itself in the timber, "so much so that the timber has to be removed more from this cause than from decay. I am of the decided opinion that the timber in which the iron lays, on an average will not last longer than three years. If this be the result, is it not a matter for consideration whether it would not be better at once to adopt a heavier iron." While this subject of defect in the road, and if the remedy necessary is brought to the attention of the stockholders, it is with some satisfaction that the board have to charge the injury sustained and complained of to an increased and continually increasing business, which in requiring a superstructure equal in strength to the tonnage daily exerting its weight and power on it, furnishes in the increased profits of transportation, the adequate means to renew the road, in sections, gradually, as proposed.

The enhanced expense in the maintenance of way, of a superstructure too light and fragile for the weight and velocity of the machines it has to resist, forms but a small portion of the injuries otherwise sustained, in all the varied operations of the road. If the track is weak and defective, and subjected to repeated dislocations; accidents accumulate, delays in the arrival of trains, involving loss of time, become more frequent, damages and forfeitures oftener incurred; and the injury

to machinery in locomotives of a delicate texture and easily deranged, becomes incalculable. In a heavy superstructure, therefore, and a firm unyielding road-bed, are reliance alone to be had for a perfect railway; adapted to any emergency, and equal to any power or velocity which it may be desirable to apply on it. This subject, therefore, is submitted to the serious consideration of the stockholders, that they may either by a committee, reared for this special purpose, examine into, and devise the means necessary to remedy the approaching difficulties, in the defect of road, anticipated; or devolve on our successors in office, ample power to act in the premises as the interest of the company may recommend. The procuring the labor necessary and required on the different sections of road, by hiring at fair rates, is another difficulty presenting itself. After hands, says the superintendent, for many years in the company's service, have acquired the knowledge and skill necessary to make them valuable, the company are either compelled to submit to higher rates of wages imposed, or to pass others at a lower rate of compensation through the same apprenticeship, with all the hazards of another strike in their turn, by the owners. The difficulty involves the advantages of the policy of owning by purchase the labor necessary for service on the road, or to continue to be exposed to all the hazards of hiring under the present system, and the chances of being raised upon in times of emergency. Mr. Lithgoe reports that ten women and seventy-five young men may be advantageously and profitably employed in the place of many of those now hired; the wages paid for whom, would be a high remuneration to the company, for the capital so invested. All of which views are respectfully submitted to the consideration of the stockholders.

The report of the master of the work shops, and of the agent of transportation, exhibits the state and condition of the property in machinery, the number of cars on hand, the number of locomotives in service and their present value, the number of those disabled but susceptible of repair, and the number which from age and hard usage are unfit for renewal, though portions of their parts may be worked up in other machinery—and the additional number of both cars and locomotives which will be necessary to meet the pressing demands of a constantly increasing business to the satisfaction of the community to be accommodated. This report is very satisfactory as to the service which has been rendered the last year by the company's locomotives, the number of miles performed, and the proportional number of engines compared with the entire number owned by the company, which have been kept in repair and on active duty. It is believed that the performance for the last six months of the year with this limited power, will bear a favorable comparison, with the like number and class of locomotives on any other road. With this report is a statement of the work performed at the smith shop, foundry and car factory. These statements go far to re-

commend the policy of a large addition to both the company's car and locomotive power. It is true economy never to press too severely upon machinery so easily deranged as that on a locomotive, and always to be so amply supplied. No locomotive after performing a trip exceeding 260 miles in extent, should resume her position on the track before a thorough examination, and reported in a proper condition by the master of the workshops. The exigencies of the business of the road, compelling the extra service of a locomotive, when disabled, or not in a proper condition, is always performed at a cost detrimental to the best interests of the company. In England, and on all economically managed railroads, it is considered advantageous to own double the number of locomotives which the actual business of the road may require, so as to afford time for examination, and reparation of all on their return trips, and to be prepared with extras for every emergency, without resorting to unprofitable expedients to meet the unexpected demands of the trade, or of a community for accommodation. *Semper Parati*, is the true motto for the guidance of all railroads, and in accordance with its admonitions, your present directors have made arrangements for such an increase of motive power, passenger and burden cars for the ensuing year, as will, in their judgment, meet the requirements of the road, and with the experience which has been their guide in this case, they recommend the execution to those who may succeed them in office.

The report of the engineer, Mr. McRae, of the Camden branch, shows the present condition and progress of that work, notwithstanding a suspension of operations the last spring for nearly two months, with a hope that the citizens of Sumter might be accommodated by a change of route in the road proposed; and the subsequent summer and winter interpositions of successive floods in the Wateree river, the work has been steadily progressing, and a hope is still encouraged that with the powerful aid of steam, and energetic contractors, the passage of the Wateree river and swamp may yet be accomplished in time to enable the company to press forward, with all practicable dispatch, during the summer and fall months, with the superstructure to Camden. A large portion of the grading along the entire line, is already completed; the whole is under contract; the wooden superstructure with the rails, between the Congaree and Wateree are now in progress. Iron sufficient for the completion of that section has arrived, and if the floods of the Wateree do not interpose any farther obstacles, than those which have already been encountered, the engineers feel confident that all the objects, as to time, in completing the road will yet be realized. But the best devised plans, and the most powerful of human efforts have, at times, to yield to elements which are not to be controlled, and often too powerful, successfully to resist.

Your Board of Directors, with such satisfaction, congratulate the stockholders on the beneficial results of that liberal policy, early

adopted on their part, of extending countenance and credit to all sister roads, having for common objects the bringing the western portions of our Union in more intimate, social and commercial relations with those of the south. The roads in Georgia and Alabama are rapidly and successfully progressing—many of them finished—new roads, penetrating more remote and hitherto inaccessible sections in those and the adjacent states of Mississippi and Tennessee, projected; and companies in progress of organization for immediate and successful action. The road from Chattanooga to Nashville is no longer a problem, and we have every assurance of the most energetic efforts to commence, and push it rapidly to completion. The Hiwassee railroad, opening a communication to Knoxville, and the interior of Eastern Tennessee, has been revived, and will receive a new impetus on the completion of the Western and Atlantic to Cross Plains, now only awaiting the daily expected arrival of the iron to finish it. The interior of Alabama is looking with deep interest to a railroad communication between the Georgia and Tuscaloosa, by the Rome branch and valley of the Coosa. Superadded to these, charters have been granted by both of the legislatures of North and South Carolina, and our people everywhere awakening to the importance of rendering more intimate and binding by railroads, the city of Charleston with the interior districts of our own and more northern sister

The most gratifying symptom, however, in all these movements, is the enlightened spirit by which the projectors seem now to be influenced—repudiating all idea of monopoly, rivalry and competition. We have witnessed with gratification, in a recent convention at Macon, indications of a desire for that concert and union in all these enterprises, by which our southern railroads are to be considered not exclusively state works, but as a part of a common system; the veins and arteries of a great commercial body, animating in the reciprocal circulations of its trade the whole, and paralyzing by impediments, or restrictions no portion. We cordially respond to views so enlightened, and so well calculated, at this time, to stimulate and bring in closer communion, interests, having the common object of prosperity to all.

Respectfully submitted,

JAMES GADSDEN.

Property Statement South Carolina Railroad Company, December 31, 1849.

| | |
|--|----------------|
| To stock—for \$35 per share on 34,800 shares..... | \$1,218,000 00 |
| To installments forfeited..... | 312,417 65 |
| To surplus income..... | 40,708 52 |
| To balance of indebtedness..... | 2,765,090 74 |
| | \$5,728,216 91 |
| By purchase Charleston and Hamburg railroad, embracing road, machinery, etc..... | \$2,714,377 50 |
| By purchase of land attached thereto..... | 59,741 30 |
| By purchase of negroes..... | 11,963 19 |
| | \$2,786,081 99 |
| By construction of Columbia branch..... | 2,863,654 49 |
| By lands purchased since January, 1844..... | \$5,063 83 |
| By less to credit Aiken lands..... | 35 35 |
| | \$5,048 08 |

| | |
|---|----------------|
| By negroes purchased since Jan. 1844..... | 800 00 |
| By suspense account..... | 8,490 00 |
| By rail iron purchased..... | 15,773 97 |
| By improvement of depots..... | 8,680 20 |
| By purchase of property..... | 130,437 49 |
| By shares in the railroad..... | 40 00 |
| By amount due on pay rolls and bills not charged, but forming part of the balance of indebtedness per statement No. 2, Dec. 31st, 1845..... | 9,210 60 |
| | \$5,728,216 91 |

Statement of the Number of Passengers conveyed upon the Railroad between Charleston, Hamburg and Columbia, with the amount received for Freight and Passage, from 1st January to 31st December, 1846.

| Month. | Number of passengers. | Am't for freight. | Am't for passage. | Total. |
|----------------|-----------------------|-------------------|-------------------|------------|
| January..... | 3,349 | 12,859 03 | 18,676 14 | 31,535 17 |
| February..... | 3,706 | 13,303 79 | 19,725 29 | 33,029 08 |
| March..... | 4,584 | 16,309 80 | 30,608 26 | 46,918 06 |
| April..... | 6,667 | 19,153 78 | 26,674 09 | 45,827 87 |
| May..... | 4,897 | 14,919 83 | 22,018 50 | 36,938 33 |
| June..... | 3,855 | 11,462 67 | 12,773 29 | 24,236 16 |
| July..... | 3,421 | 10,094 08 | 14,283 13 | 24,377 21 |
| August..... | 3,369 | 9,147 34 | 15,224 86 | 24,372 20 |
| September..... | 3,624 | 11,788 46 | 31,563 00 | 43,352 06 |
| October..... | 5,092 | 17,684 65 | 60,899 46 | 78,584 11 |
| November..... | 5,033 | 18,412 04 | 65,869 91 | 74,280 95 |
| December..... | 6,839 | 11,303 53 | 43,174 39 | 64,482 92 |
| Total..... | 164,136 | 177,444 26 | 351,689 92 | 529,134 19 |

Received for through tickets sold by Georgetown railroad company the past year..... 12,200 67

| | |
|--|------------|
| Total freight and passage..... | 531,334 79 |
| Transportation of mails for the past year..... | 39,746 76 |
| Rents, storage and other minor sources..... | 7,999 97 |
| Total receipts for the year..... | 569,081 52 |

The number of bales of cotton received in Charleston by the railroad, from 1st January to 31st December, 1846, was..... 186,971

General statement of receipts and expenditures for the year 1846.

| | |
|--|--------------|
| Gross receipts from all sources in first half year..... | \$251,741 36 |
| Ordinary current expenses for same time..... | 193,592 21 |
| Net profit for the first half year..... | 58,149 15 |
| Gross receipts from all sources second half year..... | 337,340 16 |
| Ordinary current expenses for same time..... | 221,578 96 |
| Net profits for 2d half year..... | 115,761 20 |
| Net profit for the year 1846..... | 170,910 35 |
| From the net profit two dividends have been declared, making the average per cent. on the joint dividend 5 1/2 per cent. on par value..... | 140,725 50 |

Leaving a net balance accounted for as follows, of..... 30,184 85

Reduction of balance of indebtedness in the year..... 5,946 15

Reduction of amount to debit of improvement of depots and of property, including one locomotive, and charged to income net in last 6 mos..... 11,332 78

Paid for improvement of depots and property, including one locomotive in first six months..... 9,631 49

Paid for lands..... 2,961 43

Paid on account construction of Columbia branch..... 310 00

Gross receipts from all sources for year..... \$569,081 52

Paid ordinary current expenses for year..... 418,171 17

Net profit for the year..... 170,910 35

Deduct two dividends..... 140,725 50

Leaves a balance accounted for as above..... 30,184 85

Interest on sterling bonds for the year, and included in the above amount of ordinary expenses (\$418, 171 17) \$108,530 05

THOMAS WARREN, Auditor

Wilmington and Manchester, N. C.—Or the Connecting Link—RAILROAD.

This break in the line of railroad from Portland in Maine, to the extreme limits of Georgia, has been a fruitful theme of complaint, by travellers between the north and south. It is true, that the people of North and South Carolina have done more to serve the public—or that part of it which travels than they have been paid for; yet, notwithstanding what they have done, they have been anathematized for the very little which they have left undone to complete the line of railroad between the Wilmington and the South Carolina railroads. Good steamboats, and the best attention, between Wilmington and Charleston, will never satisfy those who are subject to—or happen to enjoy the pleasures of sea sickness from an outside—or sea passage.

The inconvenience from sea sickness will be as great, to most persons, from Charleston to Wilmington as to New York, and therefore it is that a new line of superb steamers is to be added to that now composed of the "Southerner" and the "Northerner,"—between those two cities, whereas, if this railroad was now in operation, it is probable that the present line of steamboats would answer for some years yet.

There have been spirited efforts made by the people of Wilmington to open this road. In 1845 and 46 there was much exertion, and a survey was made, and a report published, which exhibits a very favorable route. The distance from Wilmington to Manchester, where it will connect with the Camden branch road, is one hundred and fifty-eight miles—151 of which are straight lines—with grades and curves as favorable as on most other roads in the country—and it can probably be built on terms highly favorable, owing to the make of the land and the abundance of good timber along the line. The estimate of its cost, made by the engineers—which we now give, accompanied with a map showing the line and its connections north to Philadelphia, and south nearly to Alabama and Tennessee—puts down the entire amount, for a single track, depots, and a good outfit of machinery, at \$1,466,000, and the net income for the first year at \$100,760, or over 6 per cent.—which ought of course to increase annually—as business and travel must necessarily increase. We have had this report some time in hand, but the map only reached us a short time since, and we are now able to,—and with much pleasure—present the subject to our readers in such a way as to enable them to see and feel its importance. They can see its relative position, and the necessity of its early construction.

By examining them a plan will be seen that the Camden branch, which is now in course of construction, and which will probably be extended to Charlotte, and the Columbia branch is now, and has long been, in operation—and which will, beyond all question, be extended to Greenville—will open to this road, an extensive region of the upland and most productive part of South Carolina; which, in addition to the through, and way business, must ensure good returns upon the investment; and, therefore, the people of Philadelphia, Baltimore, Washington, and Richmond have a double inducement to give their aid to this work, and especially the merchants of Baltimore and Philadelphia—to whom a certificate is given by all who go direct from Charleston to New York, by those splendid steam packets. If

the merchants of Philadelphia and Baltimore would secure the visits of southern merchants and business men, they must aid the people of Wilmington, and others laboring in this enterprise, to build this road; they must subscribe to its stock—they must show that they feel an interest in its early completion—they must do as Boston did to draw business from New York. Indeed they have the same inducements for aiding in this work, that Boston had in building the Western road, and has in constructing the Ogdensburgh and the Vermont roads; and to a certain extent, that the Philadelphia people have in building the central road to Pittsburgh—viz: to make the communication easier with Philadelphia than with other cities.

The amount required from them will be comparatively small—yet very important at the outset, and therefore it is that we desire to recommend this work especially to those who have so direct an interest in it.

The report it will be seen was dated December, 1846. Since then meetings have been held, and stock subscribed, as will be seen by referring to the Journal of July 10th, and August 21st, but to what extent we are not now informed—though we believe that the prospect of an early commencement of the work is quite flattering.

The report is addressed to those who furnished the means to make the survey, and says—

In compliance with your wishes and instructions, a corps was organized and the survey of the route for the contemplated road commenced in July last.

A report upon the survey, together with a map and profile of the route, we beg leave herewith to submit to you.

At the commencement, various schemes were proposed for making the necessary connection with the Wilmington and Roanoke railroad. One to cross the cape Fear, below the junction of the two rivers, with a bridge or steam ferry boat; thence over the swamp on Eagle's island and Brunswick river.

A second, to start from the depot of the road on the hill, and curving around to cross the Northeast at or near Hilton, thence across the point between the two rivers and over the Northwest. And a third, to commence at some point on the west side of the northwest branch of the cape Fear, and above the point at which the Brunswick breaks from it—and from this point the connection to be made by means of a small steamboat.

This last, being decidedly the cheapest, motives of present economy determined us in selecting it as the point at which a line to serve as a basis for our estimates should commence.

Starting, then, at 'Meare's Bluff,' 3 miles above town, the table land being reached at an elevation of 14 feet above tide water, the line pursues a northwesterly direction, for the purpose of avoiding the main body of the Green Swamp and Waccamaw lake, to near Livingston's creek, before reaching which, sufficient northing being obtained, a change of direction is made. Crossing the creek at a favorable place, about one and a half miles south of the main road, the route, passing a half mile north of the Waccamaw lake, and about one mile south of Whitesville, is continued straight, a distance of 45 miles, to within 2 miles of Fair Bluff on the Lumber river,

a designated point in the line. From thence the route passing about a half mile back of Fair Bluff and crossing the State line 2 miles below it, runs down on the ridge between the Lumber river and Gapway swamp, and crosses the former below the mouth of Ashpole swamp, and near Floyd's ferry. Thence, below the foot of the ridge between Ruff swamp and the Little Pedee, and across the latter about one mile above Dr. Gilchrist's bridge, the route follows the ridge between the 'Big Sisters' and 'Maiden Down' bays, and passes about a quarter of a mile north of Marion court house. From thence to the Great Pedee river, a favorable point for crossing which is found near the head of Mr. Gibson's dam. Crossing the river at this place, and the river swamp, 2 miles in extent, the route after crossing Polk swamp, follows the ridge between Highhill and Jeffries's creek, to a point near the road leading from Darlington court house to Ebenezer church. From thence the route is continued straight, crossing Lake and Sparrow swamps, Lynche's creek, Black river, Scape O'er and Rocky Bluff swamps, to a point south of and near Sumterville, a distance of 37 miles.

Thus far the country over which the line has passed, is generally so flat and uniform as to present but little variety, and with some few unimportant exceptions, it abounds in timber of the very best quality for the construction of the road.

The graduation throughout will be comparatively slight, and of easy execution, consisting, excepting where streams and swamps are crossed, chiefly of light embankments, sufficiently high to protect the road from the water that usually remains upon the remarkably flat surface of the earth in wet weather.

From Sumterville, the route passes over a country presenting a similar appearance to that already described, until it reaches Col. John Moore's plantation. Passing about a quarter of a mile to the south of his house, it crosses the head of 'McRae's Mill Pond,' and ascending from this, strikes in Mr. Rees field, the ridge of hills, commencing below Manchester and bordering upon the low grounds of the Wateree river, known as the 'High hills of the Santee.' Passing the ridge at its lowest point in Mr. Rees field, at an elevation of 316 feet above tide water, and about 175 feet above the Camden branch road, the route, by a continuous curve of from 2000 to 3000 feet radius, with a grade of 50 feet to the mile, and with some heavy excavations and embankments, connects with the Camden road.

Thus presenting a road 158 miles in length of which 151 miles are straight, and the balance, except that immediately at the connection, with curves of over 8,000 feet radius, with fewer heavy grades, and with less excavation and embankment than any road of similar length in the country. It may be proper here to state that we are of the opinion that further examination would demonstrate the practicability of a better route over the 'High hills of the Santee' being found, than the one here presented; time with us being limited, prevented our going into the examination as

minutely as we would otherwise have done.

Before proceeding with the estimates a description of the kind of road estimated for, becomes necessary. The graduation is intended for a single track only, and consists of excavations with slopes of 4 horizontal to 1 perpendicular; 10 feet wide at grade with side ditches, 5 feet wide at top, 2 feet deep, and 2 feet wide at bottom. Embankments 12 ft. wide at grade, and with slopes of 1½ horizontal to 1 perpendicular.

The superstructure to consist of suballs 4 by 10 inches under the bearing of the rails, and bedded so that their upper surfaces shall be two inches below the graded surface of the road, and at their joints resting on cross pieces of similar dimensions. On these the cross ties or sills 8 by 8 and 8 feet long, are placed three feet apart from centre to centre; every other one being notched on its upper surface for the reception of the rail; the alternate sill being brought to a level with the other by being notched on the under side and let down upon the suball. Upon the sills the rails 6 by 7, 4 feet 5 1/2 inches apart, and chamfered on their inner edges, one and a half inches, are placed; being confined to the notched sill by means of a wooden key, and kept in its place on the other by a wooden bracket on the outside of the rail. Over streams and swamps, lattice bridges and trestle work has been estimated for. The former on 'Towns' plan, roofed and weatherboarded to protect them from the weather, and of these there are four, viz: three of one span each, across Livingston's creek, Lumber and Little Pee Dee rivers, and one of two spans, with a draw over the Great Pee Dee.

The trestle work, where, as in the Great Pee Dee swamps, it is not over 12 feet in height, is on the plan adopted on the South Carolina roads; the piles being capped and cross braced, with string pieces 10 by 14 in., notched on the caps and secured by means of wooden keys, and on these strings the road laid. In the Great Pee Dee swamp, trestles of the form used on the Wilmington road have been estimated for, in consequence of the height at which the swamp has to be crossed, to protect the road from the action of freshets.

For a road built in this manner, with a plate rail of 2 1/2 by 1 inch, double the weight of that ordinarily used, and consequently costing about \$1400 per mile more; (and that it will answer well for the purposes for which it is intended we think no one can doubt) we present the following estimates, viz:

| | |
|--|-----------------------|
| For excavations and embankments, including grubbing and clearing..... | \$272,581 40 |
| For superstructure, including turnouts..... | 854,622 90 |
| For bridging..... | 105,535 60 |
| For warehouses and water stations on line and at each end..... | 40,000 00 |
| For pay of engineers, including contingencies: (this item depending upon the time occupied in the construction of the road)..... | 40,460 70 |
| For land damages..... | 15,000 00 |
| For 10 locomotive engines..... | 70,000 00 |
| For 8 passenger cars..... | 14,000 00 |
| For 4 baggage and mail cars..... | 4,000 00 |
| For 30 eight-wheel box cars..... | 18,000 00 |
| For 10 flat cars..... | 15,600 00 |
| For steamboat..... | 15,000 00 |
| Total..... | \$1,466,000 00 |

That portion of the road lying in North Carolina, 63 miles in extent, will cost:

| | |
|--|---------------------|
| For excavation and embankment..... | \$71,958 23 |
| For superstructure..... | 340,266 52 |
| For bridging..... | 19,570 00 |
| For warehouses and water stations..... | 13,000 00 |
| For pay of engineers, including contingencies..... | 15,200 00 |
| For land damages..... | 4,000 00 |
| For steamboat..... | 15,000 00 |
| Total..... | \$478,994 75 |

And that portion in South Carolina, 95 miles in extent, will cost:

| | |
|--|-----------------------|
| For excavation and embankment..... | \$200,623 17 |
| For superstructure..... | 514,356 38 |
| For bridging..... | 86,365 00 |
| For warehouses and water stations..... | 37,000 00 |
| For pay of engineers, including contingencies..... | 25,260 70 |
| For land damages..... | 11,000 00 |
| Motive power, as above..... | 122,400 00 |
| Total..... | \$1,466,000 00 |

It will be seen that the route on which the estimates are made, is the one adopted by the convention held at Marion court house, in August last. At that convention a different route was advocated, viz. one to run from Marion court house to Sumterville direct; and its friends were desirous that a survey of it should be made. Our limited time placed this out of our power; a reconnaissance, however was made, and we intended, in compliance with a promise to that effect, to present an approximate estimate of the cost of construction on it; but learning that the charter presented to the legislatures of the two States designates in conformity with the resolutions passed at the Marion convention, the precise route over which the road is to be built, we deemed it unnecessary at present to do so.

PROBABLE INCOME OF THE ROAD.

Under this head, it may now properly be considered out of place for an engineer to attempt anything like an estimate, as the importance and value of railroads are so well understood by the people generally, and these estimates are often necessarily made from uncertain data, consequently fallacious, and are therefore justly looked upon with discredit. But in this instance, being enabled to present an estimate based upon information obtained from authentic sources, we may be excused for venturing upon the following, the truth of which those interested can test for themselves.

The number of through passengers between Weldon and Charleston, as ascertained from the books of the Wilmington company, for the year ending 1st December 1846, was 11,000 which at \$6.

| | |
|---|---------------------|
| Would amount to..... | \$71,760 00 |
| The freight and way passengers for the same period of time amounted to..... | 192,000 00 |
| The mail to..... | 37,000 00 |
| Total..... | \$200,760 00 |

We honestly believe that the freighting business and way passengers on this road will exceed that on the Wilmington and Roanoke road, at least 25 per cent. in consequence of its passing through a country far more wealthy, more densely populated and consequently having more produce for mar-

ket and requiring more in return in the way of merchandize. And as regards the thro travel, we feel no hesitation in saying that it will be increased in like proportion, as soon as this road is built; and in support of this opinion, we have only to mention a fact that can be proved by reference to the statistics of all railroads, intended, as this is, as a thoroughfare for travel; that, as in the case of the Wilmington road, this branch of business, as indeed all others, is ever steadily increasing; (see note,) and, in addition, the contemplated road will supply a desideratum long wanted; the connecting link in the great chain of improvements between the north and south.

But to return: Assuming the probable income at what we have above stated as the receipts of the Wilmington road, (of the same length),

| | |
|---|-------------------|
| For the past year, viz..... | \$200,760 00 |
| And deducting for management and repairs, a sum which we consider amply sufficient for the first five years, viz..... | 100,000 00 |
| And we have left..... | 100,760 00 |

Which shows a profit of over 6 per cent. on the estimated cost of the road. And if to this be added the 25 per cent. increase above referred to, it will give us as the net income of the road..... 150,950 00 Over 10 per cent. on the estimated cost.

ADVANTAGES OF THE ROAD.

As to the advantages of the railroad we take pleasure in quoting statistical facts.

To the citizens of Wilmington we would instance the case of the city of Boston, where the multiplication of railroads leading to the city has increased the business of each of the former roads, by giving greater facilities for travel and business, and the fact which we find in Hunt's Merchants' Magazine for November, 1846, a work of undoubted authority, that: For substantial structure, and amount of investments, Massachusetts has taken a decided lead in railroad enterprise; and what was, by many, regarded as a doubtful experiment, has proved a good investment of capital. It appears from the census of last year that the increase of property in Boston, from 1840 to 1845, over that of the previous five years, was nearly equal to the total cost of the railroads of Massachusetts, or about nineteen millions of dollars. From the same source, it appears the import duties paid on goods by the Cunard line of steamers, in '40, was less than \$350 per voyage, or for the 6 voyages of that year, less than \$2600; and the same for 1845, was \$51,000 per voyage, or, for the 20 voyages of the year, \$1,020,000. All the industrial interests of the State have been invigorated and general prosperity promoted. The proceeds of her extensive fisheries and manufactures are carried, with the utmost facility in every direction, to meet the wants of consumers; and form the basis of a greatly increased general commerce.

The total number of passengers carried on the roads that diverge from Boston, in 1845, was nearly 240,000, or double the highest estimate for the trade of the same time by steamboats on the Hudson river, or nearly three times the total population of Massachusetts.

But we need not travel so far as Boston; the citizens of Wilmington have but to look at their own town and they will see an increase of population from 3000, what it was estimated at in 1833, to from 8 to 9000, what it is now estimated at; and an increase in the value of property of nearly 500 per cent.; the value of it being estimated in 1833, at \$310,000, and now, by an estimate made by a committee composed of competent men, its value is set down at \$1,500,000; and this astonishing increase in population and the value of property must mainly be attributed to the construction of the present road leading to the Roanoke river.

To the citizens of the country through which the road will pass, we can only say that all experience in railroads has established the fact that along the line and to a considerable extent on each side, the value of property is greatly enhanced, and the amount of produce made is constantly increased because of the facilities a road furnishes for sending it to market; waste lands are reclaimed, and those under cultivation improved; and the trees of the forest, formerly valueless, are made producers of wealth. With these facts it would not be difficult to prove that the increase in value of property consequent upon the construction of this road would far exceed the entire cost of the work.

Give the people but the opportunity of procuring a fair reward for their labor, and their habits of industry are stimulated, and their enterprise and ingenuity will extort wealth and comforts from sources now wholly unproductive; and with an awakened spirit of improvement, education and intelligence will be found making equal strides.

All of which is respectfully submitted, and signed
JOHN C. McRAE, Civil Engineer.
L. J. FLEMING, Engineer.
Wilmington, N. C. Dec. 12, 1846.

Gauge, or Width of Track for Railroad, Report on the Gauge for the St. Lawrence & Atlantic Railroad. By A. C. Morton, Chief Engineer.

Continued from page 732.

In some cases they have been so much extended, and the additional length so far removed from the fire box, that it has proved a positive disadvantage. Much of this increased length of tube is inefficient; and from their remote position from the fire add only in a small degree to the evaporating power of the boiler, for the air must be drawn through this additional length of tube, giving increased friction and requiring a stronger blast and a serious loss of power. It has been observed on an examination of tubes long in use, that the effect of the heat is visible only on the portion nearest the fire box.

Long tubes are more liable to get out of order or leak, than short ones, on account of their flexibility and the distance between points of support.

This has proved to be the case even with new engines which had been in use but a short time. To remedy this defect, supporters have been placed midway of their length; but these have given rise to other evils which are equally objectionable.

There can be no doubt that with equal superficial area, short tubes are the best, as they present a larger surface near the fire, are less liable to get choked, or out of order, and require less blast to produce the proper draft through them.

Mr. Stevenson, the great advocate of the narrow gauge, in his testimony before the gauge commissioners, states that they have made the boiler as wide as the narrow gauge will allow; and this is evident from the various expedients resorted to for the purpose of gaining an inch or two in width of fire box. He also states that he has increased the power by lengthening the boiler and fire box;—and that the engines are as large as ought to be put on the present roads.

It should be remembered that the weight and power of engines had been from time to time increased; that roads had been rebuilt, and their parts made stronger, in order to sustain these heavier engines up to the time when it was ascertained that the narrow gauge did not admit of a more powerful engine. Then, and not till then, was it stated that the engines were as powerful and as heavy as ought to be placed on any road.

There is no doubt that if more powerful engines could be built on that gauge, there would be no difficulty or hesitation in providing sufficiently strong roads to sustain them. The commissioners in their report to government, remark in reference to the narrow engines, that they "are as powerful as they can well be made within the limits of this gauge."

Major General C. W. Paisley, inspector general of railways, whose opinions from his position and from his not being an advocate of either the narrow or broad gauge, are entitled to great respect, states in his testimony before the commissioners, that "he does not think the Messrs. Stephensons' opinions of the efficiency of the narrow gauge of 4 ft. 8½ in. for all purposes has been borne out by the subsequent experience of more than two years. The gauge of 4 ft. 8½ in. does not admit of a boiler of sufficient diameter or of a fire box of sufficient width to give such power to the locomotive engine as is required by the present state of railway travelling.—Mr. Robert Stevenson has attempted to get rid of this disadvantage by lengthening his boiler in the best engines constructed by him, which are also made with outside cylinders. The lengthening of the boilers appears to me to be a failure, since it has not produced engines equal in power to those of the Great Western railway; and some of the engines with long boilers which I have observed by travelling upon them, especially the one called the 'White Horse of Kent,' used on the South Eastern railway, go very unsteadily, oscillating or rolling very much, which, if the speed were materially increased I think might prove dangerous, and which must have a tendency to injure the permanent railway." "As a further proof of the inefficiency of long boilers to obtain the object in view, I may remark that the engines made by the Messrs. Sharp (brothers), formerly Sharp & Roberts, of Manchester, as well as Mr. Tre-

vethick, of the Grand Junction railway, at Creeve, and by Mr. John Gooch of the South Western railway, travel as quick as those long boiler engines of Mr. Stephenson's, and much steadier."

From the above testimony, it appears that engines with boilers of ordinary length in use on several roads, had produced as great results and attained as high speed, with less oscillatory motion, than the engines with long boilers. It appears further, although the advocates of the narrow gauge had asserted that it affords all the room necessary for sufficiently powerful engines, yet, a great effort had notwithstanding been made to add still further to that power, but with, to say the least of it, doubtful success.

The attempt to give engines on the narrow gauge increased power by lengthening the boiler may be regarded as a failure; and no means have been suggested whereby it is likely to be accomplished, except that of increasing the diameter of the boiler, and the width of the fire box. A wider gauge will undoubtedly afford space for these changes, and lessen the irregular motion of the engine and its liability to run off the track.

The power of an engine is in proportion to the extent of its evaporating surface, or perhaps more correctly in the language of Mr. Stephenson: "The power of the engine, supposing the power to be absorbed, may be taken to be directly as the area of the fire grate or the quantity of fuel contained in the fire box."

Increasing the size of the boiler or fire box so as to bear the same proportion to a 5½ feet track that those of a narrow-gauge engine now do to 4 feet 8½ inches, would add to the extent of heating surface nearly 25 per cent.

This allows an important increase of power which will lessen the cost of transportation, and will prove highly beneficial in other respects.

There is always an advantage in having a large boiler and fire box; and although it may not be necessary at all times to use the power to the full extent, yet the same result may be obtained with greater economy, and less intense heat, consequently less injury to those parts of the engine which are so soon destroyed by fire.

The repairs of locomotive engines constitute a large part of the expenditure for power—and these repairs are required mainly on those parts exposed to the injurious effects of great heat. To work an engine economically, the boiler should never be forced by a strong blast, but the draught should be such as to produce only the amount of steam that may be applied usefully.

There is an advantage in being able to call into action the increased power, which is at command with a greater extent of heating surface and equally intense heat, for the purpose of more readily overcoming the greater resistance on portions of the road where steeper gradients prevail, or where storms of sleet and snow may have been unexpectedly encountered.

The latter difficulty is often experienced on northern roads, and more powerful engines

will be found of the greatest importance as regards economy and punctuality.

The utmost punctuality is required in the running time of trains, more particularly so on roads having but a single track where trains must pass each other at given points. A large number of the roads in the United States have but one track, and very many of the accidents on these roads result from not running to time. Delays are occasionally unavoidable, particularly with freight trains, and more powerful engines will often be capable of making up lost time, and at all times to run with greater regularity and punctuality.

But there are other and more important reasons in favor of more powerful engines. The revenue of the road is in direct proportion to the freight and passengers carried.

The effect of engines of great power is to increase the tonnage of each train, thereby with a given amount of traffic to reduce the number of trains and the number of engines required to do the business of the road.

The expenses of a road are, nearly as the miles run; therefore the effect of transporting an equal amount of tonnage with a less number of trains is an increase of net revenue.

An engine capable of drawing 20 tons of net load more than another, will, applying an average charge of 1½ pence per ton per mile, increase the earnings 25 pence for each mile run; and, allowing that your freight engines will run 300,000 miles per annum, the increased earnings by adding this amount to the average loads will be £31,250 per annum; that is nearly 50 per cent. of the whole cost of running freight trains this distance.

By adding to the power of the engine, a much larger business may be done with but a small increase of cost. Many of the expenses of locomotive power are the same whatever the power of the engine. The cost of engine men and fire men, the proportionate expense of superintendence and management, the cost of oil, etc., are the same. The cost of repairs of engines do not increase in proportion to the power of the loads drawn, but, nearly as the miles run.

As it regards fuel, it may be observed that it varies with the load, but the ratio is modified somewhat by the amount consumed in getting up steam and in standing at the station. A large engine working to the full extent of its power, as a matter of course, consumes more fuel than a small one under the same circumstances. This is the only item of increased expense, and this is fully reimbursed by diminishing the delays, accidents, and extra labor attending the use of a greater number of engines. The gauge commissioners admit this, and state decidedly that economy is in favor of large engines when working at their full power.

On many narrow gauge roads it is customary to use assistant engines to a great extent, and on the London and Birmingham road, nearly 29 per cent. of the whole number of miles run by passenger trains during the half year ending June, 1845, were with two engines to each train.

To be Continued.

NOTICE TO CONTRACTORS.—GREAT WESTERN RAILWAY, CANADA WEST.
Sealed proposals will be received until the 1st day of next October, at the Office of the Great Western Railway Company, for the Grading and Masonry of the Western Division, extending from London to Windsor, a distance of one hundred and ten miles; also for the branch to Port Sarnia, forty-five miles in length.

Plans and Specifications of the work can be examined at the Engineer's Office, in Hamilton and London, on and after the 15th of September.

C. B. STUART, Engineer.
Hamilton, July 30, 1887.

TO RAILROAD COMPANIES TO BUILD MEMBERS OF MARINE AND LOCOMOTIVE ENGINES AND BOILERS.
PASCAL IRON WORKS.

WELDED WROUGHT IRON TUBES
A French invention, in which the tubes are capable of sustaining pressure from 400 to 2500 lbs. per square inch, with Stop Blocks, T. & L. and other fixtures to suit, fitting together with screw joints, suitable for STEAM, WATER, GAS, and for LOCOMOTIVE and other STEAM BOILERS.



Manufactured and for sale by
MORRIS, TASKER & MORRIS.
Warehouse B. E. Corner of Third & Walnut Streets,
PHILADELPHIA.

RAILROAD IRON.—THE NEW JERSEY
Iron Company, Bloomington, N. J., are now making Railroad Bars, and are prepared to execute orders for any required pattern. Apply to
FULLER & BROWN, Agents.
No. 139 Greenwich, corner of Cedar street.
Philadelphia, 1887.

CHILLED RAILROAD WHEELS.—THE
undersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of Spokes or Disks, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St. below 13th,
Nov. 10, 1887. Philadelphia, Penna.

DAY, CROSKY & ROSS,
COMMISSION MERCHANTS,
57 THREADNEEDLE STREET, LONDON.
13 ORCHARD PLACE, SOUTHAMPTON.
SHIPPING & COMMISSION AGENTS

FOR
PASSENGERS, SPECIE, GOODS, PARCELS, &c.
To all parts of the United States, North and South America, West Indies, India, (overland or otherwise), Constantinople, Egypt, the Mediterranean, the Peninsula, and all parts of France—via Havre.

Agents at Cowes for the Ocean Steam Navigation of New York.
Persons wishing to transact business with Messrs. D. C. & R., will please apply to the subscriber, who will make cash advances on consignments to their address.
July 31—3m. **ROBERT GRAGIE.**

LOCOMOTIVE AND CAR AXLES.
The Subscribers are now prepared to receive orders for the well-known and approved Reading Locomotive and Car Axles—drawn to any required pattern from Bloomington only. Address
SAM'L KIMBER & CO.,
Willow Street Wharf,
Philadelphia, Pa.

BACK VOLUMES OF THE RAILROAD JOURNAL for sale at the office, No. 105 Chestnut street.

PATENT RAILROAD, SHIP AND BOAT
Spikes. The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years' successful operation, and now almost universal use in the United States (as well as England, where the subscriber obtained a patent) are found superior to any ever offered in market.

Railroad companies may be supplied with Spikes having countersink heads, suitable to holes in iron rails, to any amount, and on short notice. Almost all the railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

All orders directed to the Agent, Troy, N. York will be punctually attended to.
HENRY BURDEN, Agent.

Spikes are kept for sale, at Factory Prices, by H. & J. Townsend, Albany, and the principal Iron merchants in Albany and Troy; J. I. Brower, 222 Water St., New York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand.

MANUFACTURE OF PATENT WIRE
Rope and Cables for Inclined Planes, Standing Ship Rigging, Mines, Cranes, Tilters, etc., by
JOHN A. ROEBLING, Civil Engineer,
Baltimore, Md.

These Ropes are in successful operation on the planes of the Fortage Railroad in Pennsylvania, on the Public Ships, on Ferries and in Mines. The first rope put upon Plane No. 3, Fortage Railroad, has run 4 seasons, and is still in good condition.

FRENCH AND BAIRD'S PATENT SPARK ARRESTER.

TO THOSE INTERESTED IN
Railroads, Railroad Directors and Managers are respectfully invited to examine an improved Spark Arrester recently patented by the undersigned.

Our improved Spark Arresters have been extensively used during the last year on both passenger & freight engines, and have been brought to such a state of perfection that no annoyance from sparks or dust from the chimney of engines on which they are used is experienced.

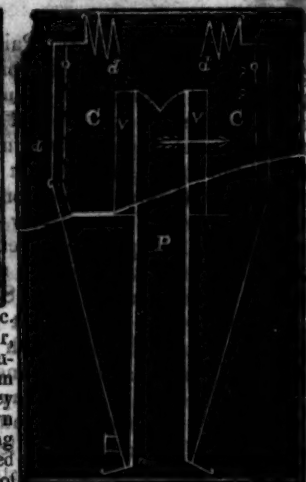
These Arresters are constructed on an entirely different principle from any heretofore offered to the public. The form is such that a rotary motion is imparted to the heated air, smoke and sparks passing through the chimney, and by the centrifugal force thus acquired by the sparks and dust they are separated from the smoke and steam, and thrown into an outer chamber of the chimney through openings near its top, from whence they fall by their own gravity to the bottom of this chamber; the smoke and steam passing off at the top of the chimney, through a capacious and unobstructed passage, thus arresting the sparks without impairing the power of the engine by diminishing the draught or activity of the fire in the furnace.

These chimneys and arresters are simple, durable and neat in appearance. They are now in use on the following roads, to the managers and other officers of which we are at liberty to refer those who may desire to purchase or obtain further information in regard to their merits:

R. L. Stevens, President Camden and Amboy Railroad Company; Richard Peters, Superintendent Georgia Railroad, Augusta, Ga.; G. A. Nicolls, Superintendent Philadelphia, Reading and Pottsville Railroad, Reading, Pa.; W. E. Morris, President Philadelphia, Germantown and Norristown Railroad Company, Philadelphia; E. B. Dudley, President W. and R. Railroad Company, Wilmington, N. C.; Col. James Gadsden, President S. C. and C. Railroad Company, Charleston, S. C.; W. C. Walker, Agent Vicksburg and Jackson Railroad, Vicksburg, Miss.; H. S. Van Rensselaer, Engineer and Sup't Hartford and New Haven Railroad; W. R. M. Kee, Sup't Lexington and Ohio Railroad, Lexington, Ky.; T. L. Smith, Sup't New Jersey Railroad, Traps, Co.; J. Elliott, Sup't Motive Power Philadelphia and Wilmington Railroad, Wilmington, Del.; J. O. Sterns, Sup't Elizabethtown and Somerville Railroad; R. R. Cuyler, President Central Railroad Company, Savannah, Ga.; J. D. Gray, Sup't Mason Railroad, Macon, Ga.; J. H. Cleveland, Sup't Southern Railroad, Monroe, Mich.; M. F. Chittenden, Sup't M. P. Central Railroad, Detroit, Mich.; G. B. Fisk, President Long Island Railroad, Brooklyn.

Orders for these Chimneys and Arresters, addressed to the subscribers, care Messrs. Baldwin & Whitney, of this city or to Hinchey & Drury, Boston, will be promptly executed.

FRENCH & BAIRD.
N. B.—The subscribers will dispose of single rights, or rights for one or more States, on reasonable terms.



The letters in the figures refer to the article given in the Journal of June, 1884.

PATENT HAMMERED RAILROAD, SHIP AND BOAT
Spikes. The Albany Iron and Nail Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes, from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscriber at the works, will be promptly executed.

JOHN F. WINSLOW, Agent.
Albany Iron and Nail Works, Troy, N. Y.
The above spikes may be had at factory prices, of Erastus Corning & Co., Albany; Hart & Merrill, New York; J. H. Whitney, do.; E. J. Etting, Philadelphia; Wm. E. Coffin & Co. Boston.

MACHINE WORKS OF ROGERS.
Ketchum & Grosvenor, Paterson, N. J. The undersigned receive orders for the following articles manufactured by them of the most superior description in every particular. Their works being extensive and the number of hands employed being large, they are enabled to execute both large and small orders with promptness and despatch.

Railroad Work.
Locomotive steam engines and tenders; Driving and other locomotive wheels, axles, springs & flange tires; car wheels of cast iron, from a variety of patterns, and axles; car wheels of cast iron with wrought tires; axles of best American refined iron; springs; boxes and bolts for cars.

Cotton, Wool and Flax Machinery
of all descriptions and of the most improved patterns, style and workmanship.
Mill gearing and Millwright work generally; hydraulic and other presses; press rollers, cutters, lathes and tools of all kinds; iron and brass castings of all descriptions.

ROGERS, KETCHUM & GROSVENOR,
Paterson, N. J., 60 Wall street, N. York.

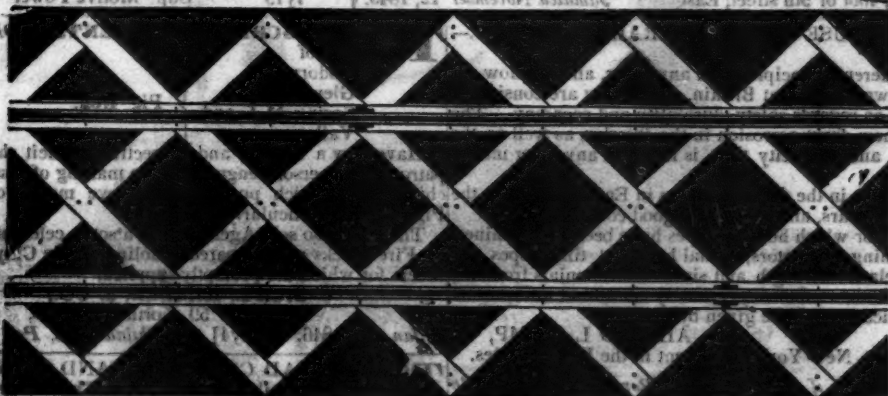
DAVENPORT & BRIDGES

CAR WORKS CAMBRIDGEPORT, MASS.



Manufacture to Order, Passenger and Freight Cars of every description, and of the most improved pattern; also furnish Snow Ploughs and Chilled Wheels of any pattern and size. Forged Axles, Springs, Boxes and Bolts for Cars at the lowest prices. All orders punctually executed and forwarded to any part of the country. Our Works are within fifteen minutes ride from State street, Boston—Omnibuses pass every fifteen minutes.

THE HERRON RAILWAY TRACK.



As seen stripped of the top ballasting

A GOLD MEDAL AWARDED THE INVENTOR BY THE AMERICAN INSTITUTE.

THE UNDERSIGNED RESPECTFULLY invites the attention of Engineers and Railroad Companies, to some highly important improvements he has recently made in the Herron system of Railway structure. These improvements enable him to effect a very large reduction in the quantity of Timber, and cost of construction, without impairing the strength of the Track, or its powers of resisting frost, while they secure additional features of excellence in the Drainage and facility of making Repairs.

The above cut represents the "Herron Track" as it is laid on the Philadelphia and Reading, and on the Baltimore and Susquehanna Railroads. The intersection of the sills of the trestles are 5 feet from centre to centre, while in the new construction they are only 2 1/2 feet. This renders the string piece unnecessary, thus removing the only objectionable feature found in the Track.

The result of experience has proved that all Tracks constructed with longitudinal timbers, such as mud sills, and more especially, the continuous bearing string pieces, retain the rain water that falls between the Rails, which, being thus confined, settles along those timbers, and accumulating in quantity flows rapidly along them on the descending grades, washing out the earth from under the timber, and frequently causing large breaches in the embankments of the road. Whereas all water intercepted by the oblique sills of the trestles is discharged immediately into the side ditches.

In the 5 foot plan, the Track occupies a Road bed nearly 4 feet wide, while the new construction takes

but 8 feet; the timber being more concentrated under the Rails. A block of hard wood, about 2 feet long and 15 inches wide, is introduced into a square of the trestles for the purpose of giving an additional, and effectual support to the joints of the Rails, which rest upon it. Should these joint blocks become chafed and worn by the working, and imbedding of the chairs, as is now the case on all Railroads, they can be readily replaced without any derangement of the timbers less liable to wear.

The following is a general estimate of its cost near the seaboard. In the interior it will be considerably less.

ESTIMATE OF THE PROBABLE COST OF ONE MILE.

| | |
|--|--------|
| 4,204 Timbers, 11 ft. long, 3 x 6 inches = | 57.24 |
| 88,696 ft. b.m., at \$10 = | 886.96 |
| 597 Oak joint blocks, 2 ft. x 3 x 15 in. = | 57.24 |
| 4,403 ft. b.m., at \$13 = | 57.24 |
| 13,000 Spikes = 2,250 lbs. at 4 cts. = | 101.25 |
| Workmanship free of patent charge = | 600.00 |

Cost of one mile, including the laying of the Rail = \$1,445.45

He has made other important improvements, which will be shown in properly proportioned models, that give a much better idea of the great strength of the Track than a drawing will do.

Sales of the Patent right to all the distant States will be made on liberal terms.

JAMES HERRON,
Civil Engineer and Patentee,
No. 277 South Tenth St., Philadelphia.

WELDED WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,
FROM 1 1/2 TO 6 INCHES DIAMETER,

and

ANY LENGTH, NOT EXCEEDING 17 FEET.

These Tubes are of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER,

Patentee.

28 Platt street, New York.

RAILROAD IRON

MOUNT SAVAGE IRON WORKS

THIS Company are prepared to execute orders for Railroad Iron, of any pattern, and equal in point of quality to any other manufactured. Address: Mount Savage Iron Works, Den. 25, 1st.

ENGINEER AND SURVEYOR

INSTRUMENTS MADE BY

EDMUND DRAPER

Surviving partner of

STANCLIFFE & DRAPER.



No 23 Pearl street, below Walnut, Philadelphia.

THE SUBSCRIBERS are agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by **A. WRIGHT & NEPHEWS**, Vine St. Wharf, Philadelphia.

West Troy, May 12, 1847.

PIG AND BLOOM IRON. THE SUBSCRIBERS are agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by **A. WRIGHT & NEPHEWS**, Vine St. Wharf, Philadelphia.

RAILROAD IRON. THE SUBSCRIBERS are agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by **A. WRIGHT & NEPHEWS**, Vine St. Wharf, Philadelphia.

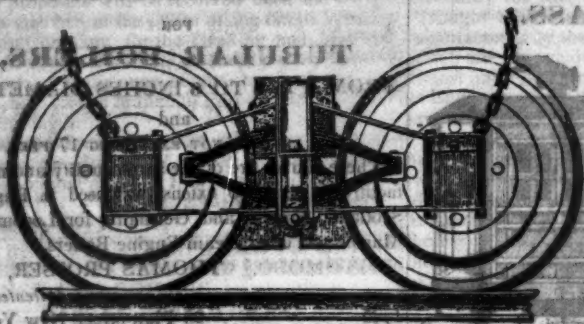
RAILROAD IRON. THE SUBSCRIBERS are agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by **A. WRIGHT & NEPHEWS**, Vine St. Wharf, Philadelphia.

LAWRENCE ROSENDALE HYDRAULIC CEMENT. This cement is warranted equal to any manufactured in this country, and has been pronounced superior to "France" and "Roman" value for Aqueducts, Locks, Bridges, Piers, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers. In tight paper barrels, by **JOHN W. LAWRENCE,** 147 Front street, New York.

Orders for the above will be received and promptly attended to at this office.

RAY'S EQUALIZING RAILWAY TRUCK.—THE SUBSCRIBER, having recently formed a business connection in the City of New



York, expressly for the manufacture of the newly patented and highly approved Railroad Truck of Mr. Fowler M. Ray, is ready to receive orders for building the same, from Railroad Companies and Car Builders in the United States, and elsewhere.

The above Truck has now been in use from one to two years on several roads a sufficient length of time to test its durability, and other good qualities, and to satisfy those who have used it, as may be seen by reference to the certificates which follow this notice.

There have been several improvements lately introduced upon the Truck, such as additional springs in the bolster of passenger cars, making them delightful riding cars—adapting it to tenders, trucks forward of the locomotive, and freight cars, which, with its original good qualities, make it in all respects the most desirable truck now offered to the public.

Orders for the above, will, for the present, be executed at the New York Screw Mill, corner 33d street and 13d avenue, (late P. Cooper's rolling mills) and at the Steam Engine Shop of T. F. Secor & Co., foot of 9th street, East

river, (of which firm the subscriber was late a partner) under the immediate supervision of Mr. Ray himself.

Several sets of trucks containing the latest improvements have recently been turned out for the New York and Erie railroad, and the New Jersey Transportation company, which may be seen upon said roads.

The patronage of Railroad Companies and Car Builders is respectfully solicited.

New York, May 4, 1846.

W. H. CALKINS, and Others.

To all whom it may concern:—This is to certify that the New Haven, Hartford and Springfield railroad co., have had in use six sets of F. M. Ray's patent trucks for the last 20 months, during which time it appears to me, they have proved to be the best and most economical truck now in use.

[Signed,]

WILLIAM ROE, Supt of Power.

I certify that F. M. Ray's Patent Equalizing Railroad Truck has been in use on the Philadelphia and Reading railroad for some time past, under a passenger car.

For simplicity of construction, economy in cost, lightness of material, and extreme ease of motion, I consider it the best truck we have ever used. Its peculiar make also renders it less liable to be thrown off the track, when passing over any obstruction. We intend using it extensively under the passenger and freight cars of the above road.

Reading, Pa., October 6, 1845.

[Signed,] G. A. NICOLL,

Supt Transportation, etc., Philadelphia and Reading Railroad.

To all whom it may concern:—This is to certify that the N. Jersey Railroad and Transportation company have used Fowler M. Ray's Truck for the last seven months, during which time it has operated to our entire satisfaction. I have no hesitation in saying that it is the simplest and most economical truck now in use.

Jersey City, November 4, 1845.

[Signed,] T. L. SMITH,

This is to certify that F. M. Ray's Patent Equalizing Railroad Truck has been in use on the Long Island railroad for the last year, under a freight car.

For simplicity of construction, economy in cost, lightness of material and ease of motion, I consider it equal to any truck we have in use.

Long Island Railroad Depot,

[Signed,] JOHN LEACH,

Jamaica November 12, 1845.

1y19 Supt Motive Power

ENGLISH PATENT WIRE ROPES—FOR THE USE OF MINES, RAILWAYS, ETC.—

For sale or imported to order by the subscriber. These Ropes are manufactured on an entirely different principle from any other, and are now almost exclusively used in the collieries and on the railways in Great Britain, where they are considered to be greatly superior to hempen ones, or iron chains, as regards safety, durability and economy. The plan upon which they are made effectually secures them from corrosion in the interior, as well as the exterior of the rope, and gives a greater compactness and elasticity than is found in any other manufacture.

Many of these ropes have been in constant operation in the different mines in England, and on the Blackwall and other inclined planes, for three and four years, and are still in good condition.

They have been applied to almost every purpose for which hempen ropes have been used—mines, heavy cranes, standing rigging, window cords, lightning conductors, signal halyards, tiller ropes, etc. Reference is made to the annexed statement for the relative strength and size. Testimonials from the most eminent engineers in England can be shown as to their efficiency, and any additional information required respecting the different descriptions and application will be given by

ALFRED L. KEMP,

75 Broad street, New York, sole agent in the United States.

Statement of Trial made at the Woolwich Royal Dock Yard, of the Patent Wire Ropes, as compared with Hempen Ropes and Iron Chains of the same strength.—October, 1841.

| WIRE ROPES. | | | | HEMPEN ROPES. | | | | CHAINS. | | | | STRENGTH. | |
|--------------------|------------------------|--------------------|--|------------------------|--------------------|-----|--|--------------------|-------------------|--|--|-----------|--|
| Wire gauge number. | Circumference of rope. | Weight per fathom. | | Circumference of rope. | Weight per fathom. | | | Weight per fathom. | Diameter of iron. | | | Tons. | |
| INCH. | LB. | OS. | | INCH. | LB. | OS. | | LB. | INCH. | | | | |
| 11 | 13 | 5 | | 10 | 21 | 2 | | 50 | 15-16 | | | 20 | |
| 12 | 11 | 3 | | 9 | 16 | 0 | | 27 | 11-16 | | | 13 | |
| 13 | 9 | 3 | | 8 | 12 | 8 | | 17 | 9-16 | | | 10 | |
| 14 | 7 | 3 | | 7 | 9 | 4 | | 13 | 1-2 | | | 7 | |
| 15 | 5 | 3 | | 6 | 8 | 8 | | 10 | 7-16 | | | 7 | |

N.B.—The working load, with a perpendicular lift, may be taken at 6 cwt. for every lb. weight per fathom, so that a rope weighing 5 lbs. per fathom would safely lift 3360 lbs., and so on in proportion.

RAILROAD SCALES.—THE ATTENTION of Railroad Companies is particularly requested to Ellicott's Scales, made for weighing loaded cars in trains, or singly, they have been the principal railroads in the country, effectually prevents vendors, and the first to make platform scales in the United States, supposing that an experience of 20 years has given a knowledge and superior advantage in the business.

The levers of our scales are made of wrought iron, all the bearers and fulcrums are made of the best cast steel, laid on blocks of granite, extending across the pit, the upper part of the scale only being made of wood. E. Ellicott has made the largest Railroad Scale in the world, its extreme length was one hundred and twenty feet, capable of weighing ten loaded cars at a single draft. It was put on the Mine Hill and Schuylkill Haven Railroad.

We are prepared to make scales of any size to weigh from five pounds to two hundred tons.

ELLICOTT & ABBOTT.

Factory, 9th street, near Coates, cor. Melon st. Office, No. 3 North 5th street, Philadelphia, Pa.

1y35

NICOLL'S PATENT SAFETY SWITCH for Railroad Turnouts. This invention, some time in successful operation on one of the principal railroads in the country, effectually prevents engines and their trains from running off the track at a switch, left wrong by accident or design.

It acts independently of the main track rails, being laid down, or removed, without cutting or displacing them.

It is never touched by passing trains, except when in use, preventing their running off the track. It is simple in its construction and operation, requiring only two Castings and two Rails; the latter, even if much worn or used, not objectionable.

Working Models of the Safety Switch may be seen at Messrs. Davenport and Bridges, Cambridgeport, Mass., and at the office of the Railroad Journal, New York.

Plans, Specifications, and all information obtained on application to the Subscriber, Inventor, and Patentee

G. A. NICOLLS,

Reading, Pa.

1y45

THE SUBSCRIBERS, AGENTS FOR

the sale of
Codorus,
Glendon,
Spring M. and
Valley,
Pig Iron.

Have now a supply, and respectfully solicit the patronage of persons engaged in the making of Machinery, for which purpose the above makes of Pig Iron are particularly adapted.

They are also sole Agents for Watson's celebrated Fire Bricks and prepared Kaolin or Fire Clay orders for which are promptly supplied.

SAM'L KIMBER & CO.,

59 North Wharves,

Jan. 11, 1846.

[1y4]

Philadelphia, Pa.

TO RAILROAD COMPANIES AND MANUFACTURERS OF RAILROAD MACHINERY.

The subscribers have for sale Am. and English bar iron, of all sizes; English blister, cast, shear and spring steel; Juniata rods; car axles, made of double refined iron; sheet and boiler iron, cut to pattern; tiers for locomotive engines, and other railroad carriage wheels, made from common and double refined B. O. iron; the latter a very superior article. The tires are made by Messrs. Baldwin & Whitney, locomotive engine manufacturers of this city. Orders addressed to them, or to us, will be promptly executed.

When the exact diameter of the wheel is stated in the order, a fit to those wheels is guaranteed, saving to the purchaser the expense of turning them out inside.

THOMAS & EDMUND GEORGE,

45 N. E. cor. 12th and Market sts., Philad., Pa.

TO LOCOMOTIVE AND MARINE ENGINE BOILER BUILDERS.

Pascal Iron Works, Philadelphia. Welded Wrought Iron Flues, suitable for Locomotives, Marine and other Steam Engine Boilers, from 2 to 5 inches in diameter. Also, Pipes for Gas, Steam and other purposes; extra strong Tube for Hydraulic Presses; Hollow Pistons for Pumps of Steam Engines, etc. Manufacture and for sale by

MORRIS TASKER & MORRIS,

Warhouse S. E. corner 3d and Walnut Sts., Philadelphia.

THE SUBSCRIBER IS PREPARED TO

execute at the Trenton Iron Works, orders for Railroad Iron of any required pattern, and warranted equal in every respect in point of quality to the best American or imported Rails. Also on hand and made to order, Bar Iron, Braziers' and Wire Rods, etc., etc.

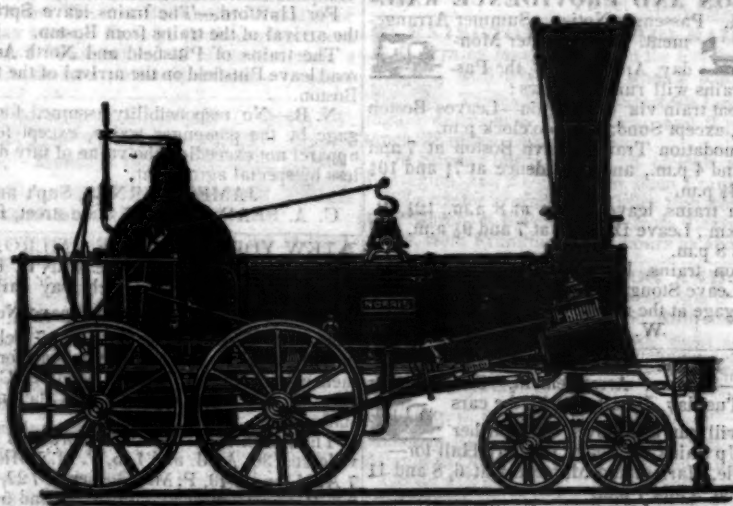
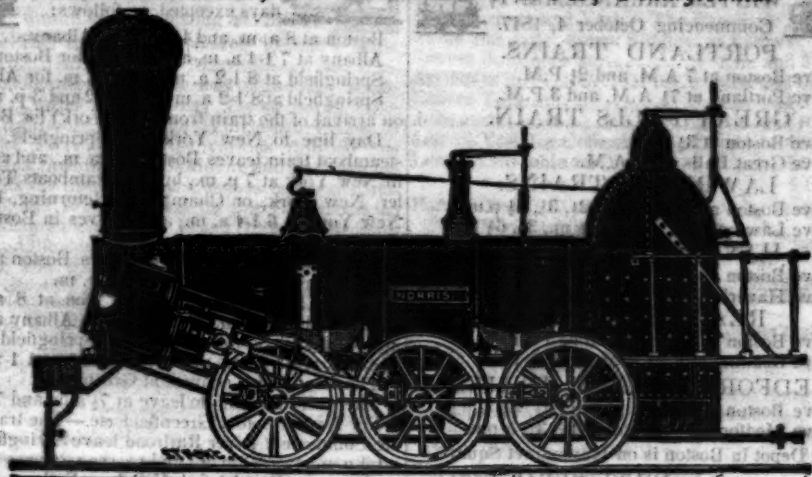
PETER COOPER 17 Burling Slip,

New York.

1y10

NORRIS' LOCOMOTIVE WORKS.

BUSH HILL, PHILADELPHIA, Pennsylvania.



MANUFACTURE their Patent 6 Wheel Combined and 8 Wheel Locomotives of the following description, viz:

| Class | 1, | 15 inches Diameter of Cylinder, x 20 inches Stroke. |
|-------|----|---|
| 2, | 14 | " " " " x 20 |
| 3, | 14 | " " " " x 20 |
| 4, | 12 | " " " " x 20 |
| 5, | 11 | " " " " x 20 |
| 6, | 10 | " " " " x 18 |

With Wheels of any dimensions, with their Patent Arrangement for Variable Expansion. Castings of all kinds made to order: and they call attention to their Chilled Wheels for the Trucks of Locomotives, Tenders and Cars.

NORRIS, BROTHERS.

KEARNEY FIRE BRICK. F. W. BRINLEY, Manufacturer, Perth Amboy, N. J. Guaranteed equal to any, either domestic or foreign. Any shape or size made to order. Terms, cash on delivery of brick on board. Refer to

James P. Allaire, Peter Cooper, Murdock, Leavitt & Co. } New York.
J. Triplett & Son, Richmond, Va.
J. R. Anderson, Tredegar Iron Works, Richmond, Va.
J. Patton, Jr. } Philadelphia, Pa.
Colwell & Co. }
J. M. L. & W. H. Scovill, Waterbury, Conn.
N. E. Screw Co. } Providence, R. I.
Eagle Screw Co. }
William Parker, Supt. Bost. and Worc. R. R.
New Jersey Malleable Iron Co., Newark N. J.
Gardner, Harrison & Co. Newark, N. J.
25,000 to 30,000 made weekly.

THE NEWCASTLE MANUFACTURING Company continue to furnish at the Works, situated in the town of Newcastle, Del. Locomotive and other steam engines, Jack screws, Wrought iron work and Brass and Iron castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention. **ANDREW C. GRAY,** President of the Newcastle Manuf. Co.

RAILROAD IRON AND LOCOMOTIVE Tyres imported to order and constantly on hand by **A. & G. RALSTON** 4 South Front St., Philadelphia, Mar. 20th

AP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 14 to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by

IRVING VAN WART

12 Platt street, New York.

JOE CUTLER, Patentee.

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

SPRING STEEL FOR LOCOMOTIVES, Tenders and Cars. The Subscriber is engaged in manufacturing Spring Steel from 14 to 6 inches in width, and of any thickness required; large quantities are yearly furnished for railroad purposes, and wherever used, its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address: **JOAN F. WINSLOW, Agent,** Albany Iron and Nail Works,

THE SUBSCRIBERS ARE PREPARED TO execute orders at their Phoenix Works for Railroad Iron of any required pattern, equal in quality and finish to the best imported.

REEVES, BUCK & CO.

Philadelphia.

ROBERT NICHOLS, Agent,

No. 79 Water St., New York.

PATENT INDESTRUCTIBLE WATER Pipes. The subscribers continue to manufacture the above Pipes, of all the sizes and strength required for City or Country use, and would invite individuals or companies to examine its merits. This pipe, unlike cast iron and lead, imparts neither color, oxide or taste, being formed of strongly riveted sheet iron, and evenly lined on the inside with hydraulic cement. While in the process of laying, it has a thick covering externally of the same—thus forming nature's own conduit of stone. The iron being thoroughly encased on both sides with cement, precludes the possibility of rust or decay, and renders the pipe truly indestructible. The prices are less than those of iron or lead. We also manufacture Basins and D. Traps, for Water Closets, on a new principle, which we wish the public to examine at 112 Fulton street, New York.

J. BALL & CO.

CONNECTION BETWEEN THE BOSTON and Lowell and the Boston and Maine Railroads. On and after April 1st, 1847, passenger trains will run as follows, viz:

Leaving Lowell at 7 11, 1-4 a.m., and 2 1-2, 4 1-2, and 6 1-2 p.m., to connect at the junction in Wilmington with the eastward trains—at 7 a.m. and 2 1-2 p.m. with those to Portland; at 4 1-2 p.m. to Great Falls only, with a detention of 45 minutes at the junction, and at 11 1-4 a.m. and 6 1-2 p.m. to Haverhill only. Leaving the junction in Wilmington, for Lowell, at about 7 1-4 a.m. on arrival of the morning train from Haverhill; at about 9 a.m., on arrival of the morning train from Great Falls. At about 11 3-4 a.m., on arrival of the morning train from Portland. At about 5 p.m. on arrival of the afternoon train from Haverhill. At about 7 1-4 p.m. on arrival of the afternoon train from Portland. **WALDO HIGGINSON, Agent.**

PATERSON RAILROAD Summer Arrangement.

Commencing April 20th, 1847, the cars will leave Paterson at New York at 8 o'clock a.m., 11 1-4 o'clock a.m., 4 o'clock p.m., 8 o'clock a.m., 11 1-4 o'clock p.m., 4 o'clock p.m., On Sunday, 8 o'clock a.m., 4 o'clock p.m., Office 75 Canal Street.

